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EXAMINER

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ART UNIT	PAPER NUMBER
	1753

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	10/029587	Applicant(s)	DALMIA PTAL
Examiner	T. TUNG	Group Art Unit	1753 Paper No. 3

[Signature]
—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- Responsive to communication(s) filed on _____.
- This action is FINAL.
- Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- Claim(s) 1-26 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) 1-26 is/are rejected.
- Claim(s) _____ is/are objected to.
- Claim(s) _____ are subject to restriction or election requirement

Application Papers

- The proposed drawing correction, filed on _____ is approved disapproved.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Pri ority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- All Some* None of the:
 - Certified copies of the priority documents have been received.
 - Certified copies of the priority documents have been received in Application No. _____.
 - Copies of the certified copies of the priority documents have been received
in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Interview Summary, PTO-413
- Notice of Reference(s) Cited, PTO-892
- Notice of Informal Patent Application, PTO-152
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Other _____

Office Action Summary

Art Unit: 1102

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otagawa et al 4,900,405 in view of Shen et al 6,080,294 and Razaq et al 5,164,053.

Otagawa discloses a sensor comprising a substrate 312, a first electrode 318 on a surface of the substrate, a second electrode 320 on the same surface of the substrate, a Nafion polymer electrolyte 326 covering the electrodes and a water hydration source 456 for the polymer electrolyte. See figures 9-10; col. 8, line 54 to col. 10, line 22. Applicant's claims differ by calling for the hydration source to be an acid solution.

Shen discloses a sensor having a Nafion polymer electrolyte 12 in contact with an acid solution 13. See figures 3-4; col. 5, line 23 to col. 6, line 42.

Razaq discloses treating a Nafion polymer with an acid to render it conductive. See col. 3, line 39 to col. 5, line 11.

It would have been obvious for Otagawa to adopt an acid solution hydration source in view of Shen, because, as taught by Razaq, acid treatment makes the polymer conductive. One of ordinary skill in the art would expect that continued acid hydration will help the polymer maintain its conductivity.

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As for the concentration of the acid recited in claims 23 and 24, that is a matter of choice in the absence of unexpected result.

Claims 1-13, 16-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maclay et al 5,716,506.

Maclay discloses a sensor comprising a substrate 12, a first porous electrode 14 on a surface of the substrate, a second porous electrode 16 on the same surface of the substrate, and a Nafion polymer electrolyte covering the electrodes. One of the electrodes is a working electrode, while the other electrode is a counter electrode. See col. 7, line 45 to col. 8, line 8. Applicant's claims differ by calling for one of the electrodes to have a low porosity (less than 5%), small pore size (less than 0.12 micron) and small thickness (less than 1 micron).

Maclay at col. 10, lines 20-40, discloses the increase sensitivity of a working electrode to CO if it has a large surface area. The surface area of a porous electrode is affected by its porosity, pore size and thickness. Thus, if the sensor were used for measuring an analyte other than CO, it would have been obvious to have low porosity, small pore size and small thickness for the working electrode in order to minimize CO interference. The particular values for the porosity, pore size and thickness recited in applicant's claim 1 are a matter of routine optimization in the absence of unexpected result. In the case of thickness, Maclay actually discloses an electrode thickness of less than 1 micron (col. 13, line 6).

As for "controlling flooding" (last line of claim 1), that would be inherently achieved by a low porosity, small pore size and small thickness porous electrode.

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In regard to claims 10-13, col. 7, line 54 of Maclay discloses forming the electrodes by vapor deposition. In any event, the manner by which the electrodes are made is not seen to affect their final structure.

In regard to claims 16-23, note that col. 7, line 57 of the patent discloses the substrate to have a surface roughness of about 0.5 to 1 micron. Such a low surface roughness presumably would correspond with the low porosity and small pore size recited by these claims.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maclay et al in view of Otagawa et al.

These claims further differ by calling for a reservoir for containing a hydration source for the polymer electrolyte.

As discussed before, Otagawa discloses a hydration reservoir 456 (figure 10) for a Nafion polymer electrolyte. It would have obvious for Maclay to adopt a hydration reservoir for its Nafion polymer electrolyte in view of Otagawa, since Maclay itself recognizes that Nafion polymer electrolyte needs hydration (see col. 10, line 68 of the patent). An in situ reservoir would ensure the continued hydration of the polymer electrolyte.

Claims 14, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maclay in view of Otagawa et al, Shen et al and Razaq et al.

These claims further differ by calling for the hydration source to comprise an acid solution. As discussed before, that is rendered obvious by Shen and Razaq.

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Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shen et al in view of Maclay et al or Otagawa et al.

As discussed before, Shen discloses a sensor including a Nafion polymer electrolyte 12, two electrodes 11, 14 and an acid solution 13 in contact with the polymer electrolyte. See figures 3-4; col. 3, line 56 to col. 6, line 42. Applicant's claims differ by calling for both electrodes to be on one surface of the substrate.

Otagawa discloses a sensor comprising a substrate with electrodes arranged on one surface of the substrate and covered by a Nafion polymer electrolyte. See figures 1 and 9; col. 5, line 17 to col. 6, line 11 and col. 8, line 54 to col. 9, line 15.

Maclay also discloses a sensor comprising a substrate with electrodes arranged on one surface of the substrate and covered by a Nafion polymer electrolyte. See figure 1; col. 7, lines 45-65.

It would have been obvious for Shen to arrange both electrodes on the same surface of a substrate and be covered by the polymer electrolyte in view of the secondary references, because this configuration facilitates manufacturing.

Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 24, line 6 of each, the "electrolyte" should be pointed to be a solid electrolyte, since the invention is clearly not drawn to a liquid electrolyte sensor.

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Claim 1, line 9 and claim 16, line 2, the value "0.12" is less than one. Thus "micrometers" should be singular.

Claim 16, line 2, does "a pore" mean that the substrate has one single pore?

The examiner can be reached at 703-308-3329. His supervisor Nam Nguyen can be reached at 703-308-3322. Any general inquiry should be directed to the receptionist at 703-308-0661. A fax number for TC 1700 is 703-872-9310.



Ta Tung

Primary Examiner

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